



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,087	11/13/2003	Kazuhisa Yamamoto	SNK-3750US3	7923
23122	7590	01/08/2008		
RATNERPRESTIA			EXAMINER	
P O BOX 980			VAN ROY, TOD THOMAS	
VALLEY FORGE, PA 19482-0980				
			ART UNIT	PAPER NUMBER
			2828	
			MAIL DATE	DELIVERY MODE
			01/08/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

TH

Office Action Summary	Application No. 10/712,087	Applicant(s) YAMAMOTO ET AL.	
	Examiner Tod T. Van Roy <i>TV</i>	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/30/2007.
- 2a) ☐ This action is **FINAL**.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 78-80 and 82-85 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 78-80 and 82-85 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some * c) ☐ None of:
 - 1. ☐ Certified copies of the priority documents have been received.
 - 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/30/2007 has been entered.

Response to Amendment

The examiner acknowledges the amending of claim 78.

Response to Arguments

Applicant's arguments filed 10/30/2007 have been fully considered but they are not persuasive.

With respect to claim 78, the applicant has argued that Yamamoto does not teach the stable proton exchange layer is configured to prevent the stable proton exchange layer from spontaneously undergoing a temporal variation in the refractive index without application of an electric field when a pseudo-phase matching condition of the stable proton exchange layer is satisfied. The Examiner does not agree.

From the previous office action:

At col.13 lines 3-20 Yamamoto describes the first embodiment of his invention. In this embodiment a correct fundamental wavelength of light is produced and enters the wavelength conversion element. This wavelength of light satisfies the pseudo-phase matching conditions, and therefor does not require the application of an electric field to the conversion element, and thereby utilizes a refractive index with no temporal variation. In a second embodiment, at col.14 lines 4-21, Yamamoto describes a case

wherein a non-fundamental wavelength of light enters the wavelength conversion element. In this situation the pseudo-phase matching conditions are not met, and an electric field is applied to the conversion element, thereby causing a temporal variation in the refractive indices to adjust for correct pseudo-phase matching.

The Yamamoto reference teaches a stable proton exchange layer that does not use an electric field to obtain a pseudo-phase matching condition. Yamamoto further teaches this operation to be stable when kept at a standard temperature (col.13 lines 3-6). The system obtains stable operation due to the use of the fundamental wave and the temperature standard and can therefor be considered "configured" to prevent spontaneous temporal variations as none of these variations are taught to plague the system. The Examiner further notes the Applicant's admission at lines 1-3 of pg.6 of the Remarks that Yamamoto's disclosure does not suggest that the proton exchange layer may spontaneously undergo temporal variation. This implies that the system can be considered to be "configured" to prevent these changes from occurring.

The Examiner suggests changing the claim language to clarify the meaning of "configured to prevent", and thereby overcome this portion of the Yamamoto reference.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 78-80, and 82-85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 5303247) in view of Rakuljic et al. (US 5691989).

With respect to claim 78, Yamamoto teaches a laser light source comprising: a semiconductor laser for emitting laser light (fig.15 #52, and additionally that the light be generated in a solid state source, col.25 lines 15-26) and an optical wavelength conversion element (fig.15 #55) for receiving the light so as to generate a harmonic wave (col.24 lines 26-27), the optical wavelength conversion element having periodic domain inverted structures (col.23 lines 14-25) formed of a proton exchange layer (col.23 line 66 – col.24 line 16) whose refractive index does not vary with time during operation, the stable proton exchange layer is configured to prevent (via use of the fundamental wave and standard temperature) the stable proton exchange layer from spontaneously undergoing (not taught to suffer from spontaneous temporal index shifts) a temporal variation in the refractive index without application of an electric field when a pseudo-phase matching condition of the stable proton exchange layer is satisfied (*two embodiments are taught, the first of which meets the claimed limitation -- when the*

Art Unit: 2828

pseudo-phase matching condition is met, using a correct fundamental wavelength, the application of an electric field to change the refractive index of the layers is not necessary to generate a harmonic output [col.13 lines 3-20] so the index does not vary with time; when the fundamental input does not meet the pseudo-phase matching conditions the refractive indices are changed [col.14 lines 4-21]. Yamamoto does not teach the semiconductor laser to be of the distributed feedback type (DFB), or the output of the laser to be amplified by a solid-state source. Rakuljic teaches a distributed feedback type laser (fig.21), and a semiconductor laser amplifier (fiber) for amplifying laser light (fig.21, col.17 lines 30-44). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser light source of Yamamoto with the DFB laser, and laser amplifier of Rakuljic in order to use a precise wavelength laser medium, DFB (cols.16-17 lines 65-9) to pump a gain media at its exact absorption peak to increase pump efficiency (cols.17 lines 35-44) and increase the output power of the laser system.

The limitations “wherein strain induced in the stable proton exchange layer during the forming of the optical wavelength conversion element is mitigated by a low-temperature annealing process after forming the optical wavelength conversion element” is rejected for the same reasons as given in the rejection to claim 78. These limitations merely detail the methods of forming the device. The method of forming a device is not germane to the patentability of the device itself, therefore these limitations are not given patentable weight. At best these limitations could be characterized as product-by-process, where the process limitations are not limiting, only the structure

implied by the process. See MPEP 2113. Here, the structure implied by the process steps is merely the structure of claim 78.

With respect to claim 79, Yamamoto, and Rakuljic teach the laser light source outlined in the rejection to claim 78, and Yamamoto further teaches the optical wavelength conversion element to have a modulation function (col.24 lines 30-31, amplitude modulation).

With respect to claim 80, Yamamoto, and Rakuljic teach the laser light source outlined in the rejection to claim 78, and Yamamoto further teaches the optical wavelength conversion element to be formed on an $\text{LiNb}(x)\text{Ta}(1-x)\text{O}(3)$ substrate (col.23 lines 17-18, $x=1$).

With respect to claim 82, Yamamoto, and Rakuljic teach a semiconductor laser for emitting laser light (Yamamoto, fig.15 #52), and an optical wavelength conversion element in which periodic domain inverted structures (Yamamoto, col.23 lines 13-25) and an optical waveguide are formed (Yamamoto, col.24 line 22). Yamamoto, and Rakuljic do not teach the width and thickness of the waveguide to be 40um or greater. It would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the dimensions of Yamamoto and Rakuljic to 40um or greater to adjust the power and modal outputs to fit the desired application (see MPEP 2144.05 II - In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) – describing it is not patentable to discover the optimal ranges by routine experimentation, namely waveguide dimensions).

Claims 83-84 are rejected for the same reasons as given in the rejections to claims 79-80 above.

With respect to claim 85, Yamamoto, and Rakuljic teach the laser light source outlined in the rejection to claim 82, and Yamamoto further teaches the waveguide is of a graded type (Yamamoto, col.5 lines 48-60, index grading).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/712,087
Art Unit: 2828

Page 8

TVR

